

**ABSTRACT**

Disclosed is a biopharmaceutical product cryopreservation system, for cryopreserving a biopharmaceutical product that includes a cryopreservation compartment; a cryopreservation fluid located within the cryopreservation compartment; and a biopharmaceutical product cryopreservation vial located within the cryopreservation compartment and surrounded by the cryopreservation fluid, and the biopharmaceutical product cryopreservation vial including a body that includes an oblong cross-section defining proximal and distal ends of the body, and at least one nucleating structure, coupled to a distal end of the body, and the body including a cryogenically stable material that is compatible with biopharmaceutical products. Also disclosed are cryopreservation vials and methods of cryopreserving biopharmaceutical products.